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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Tomoyuki Shinoda

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5671

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EXAMINER

PATEL, RONAK C

ART UNIT

PAPER NUMBER

1788

NOTIFICATION DATE

DELIVERY MODE

07/21/2011

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/573,656	SHINODA ET AL.	
	Examiner	Art Unit	
	RONAK PATEL	1788	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 May 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3,4,7-16, 21-26 and 32-34 is/are pending in the application.
- 4a) Of the above claim(s) 3-4, 7-11, 21-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-16 and 32-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. This application contains claims 3-4, 7-11, 21-26 drawn to an invention nonelected with traverse in the reply filed on 04/26/2010. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 12, 13, 16 and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugimori et al. (US 6670006) in view of Kumagai et al. (US 2003/0088108), Tominaga et al. (US 4444818) and Asano et al. (JP 2002-128989).**

4. Regarding claims 12, 13, 16 and 32-34, Sugimori discloses an epoxy resin composition for fiber reinforced plastics ("FRP"), and a prepreg that is an intermediate material made up of an epoxy resin composition (which acts as the matrix resin) combined with reinforcing fibers (abstract). Epoxy resins which act as the matrix resin after curing are excellent in mechanical, electrical and adhesive properties and widely

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used in the field of electronic materials, coating materials (col. 1, lines 20—24), which makes it an adhesive composition. The epoxy resin composition comprises epoxy resins i.e. thermosetting resin, and a curing agent (abstract) wherein the curing agent of the epoxy resin composition can be include imidazole compounds etc (col. 5, lines 24-29). Sugimori discloses that the epoxy resin composition for FRP comprises component A, component B, component C, component D (col. 2, lines 40-43), where component D is thermoplastic resin in order to improve the handleability of prepeg can be improved (col. 5, lines 35-43). Sugimori discloses a subject matter prepeg comprising a sheet of reinforcing fibers impregnated with epoxy resin composition (matrix resin) (col. 2, lines 46-50). Sugimori also discloses the reinforcing fibers is made of carbon fibers, glass fibers, aramid fibers, boron fibers, steel fibers singly or in combination wherein carbon fibers are preferred since the mechanical properties after molding are good (col. 7, lines 18-23).

5. However, Sugimori fails to disclose that the adhesive composition comprises imidazole silane compound in an amount of 0.1-10 wt% and thermoplastic resin in the form of particles having a diameter of 3 to 20 micrometer in an amount of 5-50 wt% as claimed.

6. Whereas, Kumagai discloses an imidazole/organic monocarboxylic acid salt is prepared by reacting an imidazole compound represented by general formula (I) with a silane compound having a glycidoxy group represented by formula (2) reacts to form an imidazole silane compound such as formula (II) of the claim 32 of the present invention. (para 0019). Kumagai also discloses that the imidazole/organic reactive product is

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added to a resin such as epoxy resin to promote the adhesive strength and the mechanical strength of the resin are improved (para 0007). The imidazole/organic derivative reaction product when added as resin additive can be added in an amount from 0.01 to 50 parts by weight (para 0023). The motivation for including an imidazole silane compound such as formula II of claim 32 in an amount of 0.01 to 50 parts by weight along with the epoxy resin is to improve the adhesive and mechanical strength (para 0007 and 0023).

7. Whereas, Tominaga discloses a thermosetting adhesive sheet comprising a thermosetting resin sheet shaped prepeg with a reinforcing material (abstract).

Tominaga discloses that in order to form thermosetting resin composition layers, epoxy resins are preferred and various additives can be added in the thermosetting resin composition (col. 4, lines 10-15) and additives includes thermoplastic resin such as polyamide (col. 4, lines 56-58). The motivation for including a thermoplastic resin such as polyamide along with the epoxy resin is to improve moldability (col. 4, line 56).

8. Whereas, Asano discloses an epoxy resin composition characterized by porosity resin particles containing one to 80 weight sections to epoxy resin and the resin particle is polyamide (claims 1 and 4). The porosity resin particles contains one to 80 weight section (para 0006). The resin particle is 1-20 micrometer of mean particle size (claim 2). The motivation for using polyamide resin particle in an amount of 1-80 wt% with a mean particle diameter size of 1-20 micrometer is if the particle diameter is less than 1 micrometer, handling will be worsen and if its larger than 20, then thixotropic effect will

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fall (para 0018) and to maintain the particle effect and form improved mechanical properties (para 0016).

9. In light of the motivation of including an imidazole silane compound in an amount from 0.01 to 50 parts by weight and including thermoplastic resin such as polyamide in an amount of 1-80 wt% with a mean particle size of 1-20 micrometers with the epoxy resin composition as taught by Kumagai, Tominaga and Asano as described above, it therefore would have been obvious to one of ordinary skill in the art at the time of invention to include an imidazole silane compound in an amount of 0.01-50 parts by weight of Kumagai and thermoplastic resin such as polyamide in an amount of 1-80 wt% of Tominaga with the mean particle size of 1-20 micrometer as taught by Asano in the adhesive composition of Sugimori motivated by the desire to improve the adhesive and mechanical strength of the composition and improve moldability characteristics and improve handling and thixotropic properties and to maintain the particle effect and form improved mechanical properties.

10. **Claims 12-16 and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over unpatentable over Friedrich et al. (US 5340946) in view of Sugimori et al. (US 6670006), Kumagai et al. (US 2003/0088108), Tominaga et al. (US 4444818) and Asano et al. (JP 2002-128989).**

11. Regarding claim 12-16 and 32-34, Friedrich discloses an adhesive composition comprising at least one film forming polymeric resin such as epoxies i.e. thermosetting resin and a curing agent (abstract). Friedrich discloses in example 5 in column 18,

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where the adhesive layer is laminated on the surface of a substrate which comprises a piece of fiberglass reinforced epoxy laminate and a piece of epoxy prepeg was placed on the fiberglass reinforced epoxy laminate and epoxy resin of the prepeg was cured. The surface of the cured prepeg was then brushed in order to roughen the surface prior to the application of the adhesive layer.

12. However, Friedrich fails to disclose that the reinforcing fibers are impregnated with the adhesive resin composition such as matrix resin, the reinforcing fibers are carbon fibers, and the adhesive resin composition comprises an imidazole compound in an amount of 0.1-10 wt% and thermoplastic resin in the form of particles having a diameter of 3 to 20 micrometer in an amount of 5-50 wt% as claimed.

13. However, Sugimori discloses an epoxy resin composition for FRP and a prepeg that is an intermediate material made up of an epoxy resin composition (which acts as the matrix resin) combined with reinforcing fibers (abstract). Epoxy resins which acts as the matrix resin after curing are excellent in mechanical, electrical and adhesive properties and widely used in the field of electronic materials, coating materials (col. 1, lines 2—24), which makes it an adhesive composition. The epoxy resin composition comprises epoxy resins i.e. thermosetting resin, and a curing agent (abstract) wherein the curing agent of the epoxy resin composition can be include imidazole compounds etc (col. 5, lines 24-29). Sugimori discloses that the epoxy resin composition for FRP comprises component A, component B, component C, component D (col. 2, lines 40-43), where component D is thermoplastic resin in order to improve the handleability of prepeg can be improved (col. 5, lines 35-43). Sugimori discloses a subject matter

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prepeg comprising a sheet of reinforcing fibers impregnated with epoxy resin composition (matrix resin) (col. 2, lines 46-50). Sugimori also discloses the reinforcing fibers is made of carbon fibers, glass fibers, aramid fibers, boron fibers, steel fibers singly or in combination wherein carbon fibers are preferred since the mechanical properties after molding are good (col. 7, lines 18-23). The motivation for impregnating reinforcing fibers with the adhesive composition such as matrix resin and using the curing agent as imidazole compound is to form a prepeg that has suitable tack and flexibility and is good in balance between stability with time and curability and also the crushing and the flexural strength in a direction of 90 degree are improved (col. 7, lines 50-58) and the motivation for using the carbon fibers in the prepeg is to have good mechanical properties after molding (col. 7, lines 18-23).

14. Whereas, Kumagai discloses an imidazole/organic monocarboxylic acid salt is prepared by reacting an imidazole compound represented by general formula (I) with a silane compound having a glycidoxy group represented by formula (2) reacts to form an imidazole silane compound such as formula (II) of the claim 32 of the present invention. (para 0019). Kumagai also discloses that the imidazole/organic reactive product is added to a resin such as epoxy resin to promote the adhesive strength and the mechanical strength of the resin are improved (para 0007). The imidazole/organic derivative reaction product when added as resin additive can be added in an amount from 0.01 to 50 parts by weight (para 0023). The motivation for including an imidazole silane compound such as formula II of claim 32 in an amount of 0.01-50 parts by weight along with the epoxy resin is to improve the adhesive and mechanical strength (para

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0007). Further, the data is not persuasive given that Kumagai already recognizes the criticality of using imidazole silane, namely, that using such imidazole silane would improve adhesion which is the same motivation as disclosed in the present invention.

15. Whereas, Tominaga discloses a thermosetting adhesive sheet comprising a thermosetting resin sheet shaped prepeg with a reinforcing material (abstract).

Tominaga discloses that in order to form thermosetting resin composition layers, epoxy resins are preferred and various additives can be added in the thermosetting resin composition (col. 4, lines 10-15) and additives include thermoplastic resin such as polyamide (col. 4, lines 56-58). The motivation for including a thermoplastic resin such as polyamide along with the epoxy resin is to improve moldability (col. 4, line 56).

16. Whereas, Asano discloses an epoxy resin composition characterized by porosity resin particles containing one to 80 weight sections to epoxy resin and the resin particle is polyamide (claims 1 and 4). The porosity resin particles contain one to 80 weight section (para 0006). The resin particle is 1-20 micrometer of mean particle size (claim 2). The motivation for using polyamide resin particle in an amount of 1-80 wt% with a mean particle diameter size of 1-20 micrometer is if the particle diameter is less than 1 micrometer, handling will be worsen and if its larger than 20, then thixotropic effect will fall (para 0018) and to maintain the particle effect and form improved mechanical properties (para 0016).

17. In light of the motivation of impregnating reinforcing fibers with the matrix resin and using the curing agent as imidazole compound in an amount of 0.01-50 parts by weight and using the carbon fibers in the prepeg and including an imidazole compound

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and thermoplastic resin such as polyamide in an amount of 1-80 wt% with a mean particle size of 1-20 micrometers as taught by Sugimori, Kumagai, Tominaga and Asano as described above, it therefore would have been obvious to one of ordinary skill in the art at the time of invention to use adhesive composition with epoxy and imidazole compound wherein carbon fibers are impregnate the reinforcing fibers of Friedrich with the reinforcing carbon fibers with an imidazole with the adhesive composition as taught by Sugimori to form a prepreg that has suitable tack and flexibility and is good in balance between stability with time and curability and also the crushing and the flexural strength in a direction of 90 degree are improved to have good mechanical properties after molding (col. 7, lines 18-23) and it therefore would have been obvious to one of ordinary skill in the art at the time of invention to include an imidazole silane compound in an amount of 0.01-50 parts by weight of Kumagai in the adhesive composition of Friedrich motivated by the desire to improve the adhesive and mechanical strength of the composition and thermoplastic resin such as polyamide in an amount of 1-80 wt% of Tominaga with the mean particle size of 1-20 micrometer as taught by Asano in the adhesive composition of Friedrich motivated by the desire to improve moldability characteristics and improve handling and thixotropic properties and to maintain the particle effect and form improved mechanical properties.

18. Claims 12, 13, 16 and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugimori et al. (US 6670006) in view of Kumagai et al. (US 2003/0088108) and Asano et al. (JP 2002-128989).

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19. Regarding claims 12, 13, 16 and 32-34 Sugimori discloses an epoxy resin composition for FRP and a prepeg that is an intermediate material made up of an epoxy resin composition (which acts as the matrix resin) combined with reinforcing fibers (abstract). Epoxy resins which act as the matrix resin after curing are excellent in mechanical, electrical and adhesive properties and widely used in the field of electronic materials, coating materials (col. 1, lines 2—24), which makes it an adhesive composition. The epoxy resin composition comprises epoxy resins i.e. thermosetting resin, and a curing agent (abstract) wherein the curing agent of the epoxy resin composition can be include imidazole compounds etc (col. 5, lines 24-29). Sugimori discloses that the epoxy resin composition for FRP comprises component A, component B, component C, component D (col. 2, lines 40-43), where component D is thermoplastic resin in order to improve the handleability of prepeg can be improved (col. 5, lines 35-43). Sugimori discloses a subject matter prepeg comprising a sheet of reinforcing fibers impregnated with epoxy resin composition (matrix resin) (col. 2, lines 46-50). Sugimori also discloses the reinforcing fibers is made of carbon fibers, glass fibers, aramid fibers, boron fibers, steel fibers singly or in combination wherein carbon fibers are preferred since the mechanical properties after molding are good (col. 7, lines 18-23).

20. However, Sugimori fails to disclose that the adhesive composition comprises imidazole silane compound in an amount of 0.1-10 wt% and thermoplastic resin in the form of particles in an amount of 5-50 wt% having a diameter of 3 to 20 micrometer as claimed.

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21. Whereas, Kumagai discloses an imidazole/organic monocarboxylic acid salt is prepared by reacting an imidazole compound represented by general formula (I) with a silane compound having a glycidoxy group represented by formula (2) reacts to form an imidazole silane compound such as formula (II) of the claim 32 of the present invention. (para 0019). Kumagai also discloses that the imidazole/organic reactive product is added to a resin such as epoxy resin to promote the adhesive strength and the mechanical strength of the resin are improved (para 0007). The imidazole/organic derivative reaction product when added as resin additive can be added in an amount from 0.01 to 50 parts by weight (para 0023). The motivation for including an imidazole silane compound such as formula II of claim 32 in an amount of 0.01 to 50 parts by weight along with the epoxy resin is to improve the adhesive and mechanical strength (para 0007 and 0023).

22. Whereas, Asano discloses an epoxy resin composition characterized by porosity resin particles containing one to 80 weight sections to epoxy resin and the resin particle is polyamide (claims 1 and 4). The porosity resin particles contains one to 80 weight section (para 0006). The resin particle is 1-20 micrometer of mean particle size (claim 2). The motivation for using polyamide resin particle in an amount of 1-80 wt% with a mean particle diameter size of 1-20 micrometer is if the particle diameter is less than 1 micrometer, handling will be worsen and if its larger than 20, then thixotropic effect will fall (para 0018) and to maintain the particle effect and form improved mechanical properties of the epoxy resin composition (para 0016).

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23. As Asano discloses epoxy resin composition comprising an epoxy resin along with polyamide particles in an amount of 1-80 wt% with a particle size of 1-20 micrometer with impact fracture proof characteristics and crack proof destructive characteristics and mechanical properties, it therefore would be obvious to combine with the epoxy resin composition for prepeg taught by Sugimori, which comprises epoxy resin and thermoplastic resin that dissolves uniformly in a mixture of the epoxy resin.

24. In light of the motivation of including an imidazole silane compound in an amount of 0.01-50 parts by weight and including thermoplastic resin such as polyamide in an amount of 1-80 wt% with a mean particle size of 1-20 micrometers with the epoxy resin composition as taught by Kumagai, and Asano as described above, it therefore would have been obvious to one of ordinary skill in the art at the time of invention to include an imidazole silane compound in an amount of 0.01-50 parts by weight of Kumagai and thermoplastic resin such as polyamide in an amount of 1-80 wt% with the mean particle size of 1-20 micrometer as taught by Asano in the adhesive composition of Sugimori motivated by the desire to improve the adhesive and mechanical strength of the composition and improve moldability characteristics and improve handling and thixotropic properties and to maintain the particle effect and form improved mechanical properties.

25. **Claims 12-16 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over unpatentable over Friedrich et al. (US 5340946) in view of**

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Sugimori et al. (US 6670006), Kumagai et al. (US 2003/0088108) and Asano et al. (JP 2002-128989).

26. Regarding claim 12-16, Friedrich discloses an adhesive composition comprising at least one film forming polymeric resin such as epoxies i.e. thermosetting resin and a curing agent (abstract). Friedrich discloses in example 5 in column 18, where the adhesive layer is laminated on the surface of a substrate which comprises a piece of fiberglass reinforced epoxy laminate and a piece of epoxy prepeg was placed on the fiberglass reinforced epoxy laminate and epoxy resin of the prepeg was cured. The surface of the cured prepeg was then brushed in order to roughen the surface prior to the application of the adhesive layer.

27. However, Friedrich fails to disclose that the reinforcing fibers are impregnated with the adhesive resin composition such as matrix resin, the reinforcing fibers are carbon fibers, the adhesive resin composition comprises an imidazole compound in an amount of 0.1-10 wt% and thermoplastic resin in an amount of 5-50 wt% in the form of particles having a diameter of 3 to 20 micrometer as claimed.

28. However, Sugimori discloses an epoxy resin composition for FRP and a prepeg that is an intermediate material made up of an epoxy resin composition (which acts as the matrix resin) combined with reinforcing fibers (abstract). Epoxy resins which acts as the matrix resin after curing are excellent in mechanical, electrical and adhesive properties and widely used in the field of electronic materials, coating materials (col. 1, lines 2—24), which makes it an adhesive composition. The epoxy resin composition comprises epoxy resins i.e. thermosetting resin, and a curing agent (abstract) wherein

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the curing agent of the epoxy resin composition can be include imidazole compounds etc (col. 5, lines 24-29). Sugimori discloses that the epoxy resin composition for FRP comprises component A, component B, component C, component D (col. 2, lines 40-43), where component D is thermoplastic resin in order to improve the handleability of prepeg can be improved (col. 5, lines 35-43). Sugimori discloses a subject matter prepeg comprising a sheet of reinforcing fibers impregnated with epoxy resin composition (matrix resin) (col. 2, lines 46-50). Sugimori also discloses the reinforcing fibers is made of carbon fibers, glass fibers, aramid fibers, boron fibers, steel fibers singly or in combination wherein carbon fibers are preferred since the mechanical properties after molding are good (col. 7, lines 18-23). The motivation for impregnating reinforcing fibers with the adhesive composition such as matrix resin and using the curing agent as imidazole compound is to form a prepeg that has suitable tack and flexibility and is good in balance between stability with time and curability and also the crushing and the flexural strength in a direction of 90 degree are improved (col. 7, lines 50-58) and the motivation for using the carbon fibers in the prepeg is to have good mechanical properties after molding (col. 7, lines 18-23).

29. Whereas, Kumagai discloses an imidazole/organic monocarboxylic acid salt is prepared by reacting an imidazole compound represented by general formula (I) with a silane compound having a glycidoxy group represented by formula (2) reacts to form an imidazole silane compound such as formula (II) of the claim 32 of the present invention. (para 0019). Kumagai also discloses that the imidazole/organic reactive product is added to a resin such as epoxy resin to promote the adhesive strength and the

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mechanical strength of the resin are improved (para 0007). The imidazole/organic derivative reaction product when added as resin additive can be added in an amount from 0.01 to 50 parts by weight (para 0023). The motivation for including an imidazole silane compound such as formula II of claim 32 in an amount of 0.01 to 50 parts by weight along with the epoxy resin is to improve the adhesive and mechanical strength (para 0007 and 0023). Further, the data is not persuasive given that Kumagai already recognizes the criticality of using imidazole silane, namely, that using such imidazole silane would improve adhesion which is the same motivation as disclosed in the present invention.

30. Whereas, Asano discloses an epoxy resin composition characterized by porosity resin particles containing one to 80 weight sections to epoxy resin and the resin particle is polyamide (claims 1 and 4). The porosity resin particles contains one to 80 weight section (para 0006). The resin particle is 1-20 micrometer of mean particle size (claim 2). The motivation for using polyamide resin particle in an amount of 1-80 wt% with a mean particle diameter size of 1-20 micrometer is if the particle diameter is less than 1 micrometer, handling will be worsen and if its larger than 20, then thixotropic effect will fall (para 0018) and to maintain the particle effect and form improved mechanical properties (para 0016).

31. As Asano discloses epoxy resin composition comprising an epoxy resin along with polyamide particles in an amount of 1-80 wt% with a particle size of 1-20 micrometer with impact fracture proof characteristics and crack proof destructive characteristics and mechanical properties, it therefore would be obvious to combine with

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the epoxy resin composition for prepeg which comprises epoxy resin and thermoplastic resin that dissolves uniformly in a mixture of the epoxy resin.

32. In light of the motivation of impregnating reinforcing fibers with the matrix resin and using the curing agent as imidazole compound and using the carbon fibers in the prepeg and including an imidazole compound in an amount of 0.01-50 parts by weight and thermoplastic resin such as polyamide in an amount of 1-80 wt% with a mean particle size of 1-20 micrometers as taught by Sugimori, Kumagai and Asano as described above, it therefore would have been obvious to one of ordinary skill in the art at the time of invention to use adhesive composition with epoxy and imidazole compound wherein carbon fibers are impregnate the reinforcing fibers of Friedrich with the reinforcing carbon fibers with an imidazole with the adhesive composition as taught by Sugimori to form a prepeg that has suitable tack and flexibility and is good in balance between stability with time and curability and also the crushing and the flexural strength in a direction of 90 degree are improved to have good mechanical properties after molding (col. 7, lines 18-23) and it therefore would have been obvious to one of ordinary skill in the art at the time of invention to include an imidazole silane compound in an amount of 0.01-50 parts by weight of Kumagai in the adhesive composition of Friedrich motivated by the desire to improve the adhesive and mechanical strength of the composition and thermoplastic resin such as polyamide in an amount of 1-80 wt% with the mean particle size of 1-20 micrometer as taught by Asano in the adhesive composition of Friedrich motivated by the desire to improve moldability characteristics

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and improve handling and thixotropic properties and to maintain the particle effect and form improved mechanical properties.

Response to Arguments

33. Applicant's arguments filed 05/10/2011 have been fully considered but they are not persuasive. Applicant argues that Sugimori, Kumagai, Friedrich all fails to disclose the employment of thermoplastic resin in combination with an imidazole silane compound. However, applicant does agree that Sugimori discloses some examples of thermoplastic resins, but does not encompass the resins recited in claim 12. However, this why Tominaga is used as teaching reference which discloses a thermosetting adhesive sheet comprising a thermosetting resin sheet shaped prepeg with a reinforcing material (abstract). Tominaga discloses that the in order to form thermosetting resin composition layers, epoxy resins are preferred and various additives can be added in the thermosetting resin composition (col. 4, lines 10-15) and additives includes thermoplastic resin such as polyamide (col. 4, lines 56-58) motivated by the desire to improve moldability.

34. Applicant argues that Tominaga fails to disclose the use of an imidazole silane compound and there would be no basis for a motivation to one of ordinary skill in the art to selectively combine an imidazole compound from Kumagai with a thermosetting resin from Sugimori and a thermoplastic resin from Tominaga. However, note that while Tominaga do not disclose all the features of the present claimed invention, Tominaga is used as teaching reference, and therefore, it is not necessary for this secondary

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reference to contain all the features of the presently claimed invention, *In re Nievelt*, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973), *In re Keller* 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981). Rather this reference teaches a certain concept, namely including a thermoplastic resin such as polyamide and in combination with the primary reference, discloses the presently claimed invention.

35. Applicant argues that Kumagai fails to recognize the advantageously improved adhesive properties exhibited when imidazole silane compounds are used, with respect to titanium or titanium alloys and there is no motivation to use imidazole silane compounds in Sugimori or Friedrich. However, it would be obvious that the prepeg comprising the adhesive resin composition and reinforcing material taught by Sugimori et al. (US 6670006) in combination with the imidazole compound of Kumagai et al. (US 2003/0088108) and the thermoplastic polyamide particles taught by Tominaga et al. (US 4444818), it would naturally flow from these teachings that the adhesive properties of the epoxy resin composition would be improved when imidazole silane compounds are used, especially with respect to titanium or titanium alloys. Kumagai particularly shows improved adhesive properties when imidazole silane compounds are used (Kumagai, in para 0007).

Conclusion

36. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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37. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

38. Any inquiry concerning this communication or earlier communications from the examiner should be directed to RONAK PATEL whose telephone number is (571)270-1142. The examiner can normally be reached on Monday to Friday 8 AM EST to 6PM EST.

39. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alicia Chevalier can be reached on 571-272-1490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

40. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. P./
Examiner, Art Unit 1788
07/14/2011

/Hoa (Holly) Le/
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